DOCUMENT RESUME

ED 222 286 PS 013 149

AUTHOR Duckett, Jean Constance
TITLE Representational Competence and the Ability to Succeed with First Grade Learning Activities.
PUB DATE May 81
NOTE 9p.; Paper presented at the Annual University of South Carolina Conference on Educational Issues and Research (3rd, Columbia, SC, November 6-7, 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Cognitive Ability; *Competence; *Elementary School Students; Grade 1; *Instructional Materials; *Learning Activities; *Pictorial Stimuli; Primary Education; Research Needs; School Readiness; Urban Youth
IDENTIFIERS Distancing Model (Sigel); Object Categorization Test; Picture Categorization Test; *Representational Competence; South Carolina

ABSTRACT

Sixty beginning first-grade students in an urban school district in South Carolina participated in a study investigating the relationship between representational competence and the ability to perform first-grade learning tasks. Representational competence may be defined as the ability to use representations of reality (such as pictures, symbols, or images) to perform logical operations. The present study focused on the pictorial level of representation and attempted to determine whether typical curriculum activities used in the district's first-grade classrooms demanded a higher level of representational competence than that attained by first graders in the district. Nine learning tasks requiring pictorial comprehension were selected from readiness materials. The tasks dealt with interpreting a picture, classifying objects into categories, sequencing and predicting events, relating pictures and sentences, determining cause and effect, and identifying items belonging or not belonging to a given category. In two individual testing situations, each child was asked to perform the randomly ordered learning tasks. Sigel's Object and Picture Categorization Test was administered to determine subjects' levels of representational competence, and each child's test responses were examined to determine his or her preferred style of grouping. Results are discussed. (RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED222286

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

REPRESENTATIONAL COMPETENCE AND THE ABILITY TO SUCCEED WITH FIRST GRADE LEARNING ACTIVITIES

by

Jean Constance Duckett

Ph.D. University of South Carolina

May, 1981

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Jean C. Duckett

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Paper presented at
THE UNIVERSITY OF SOUTH CAROLINA THIRD ANNUAL CONFERENCE
ON EDUCATIONAL ISSUES AND RESEARCH
Columbia, South Carolina
November 6 and 7, 1981

PS013149

In our society, knowledge gained by one generation is passed on to the next generation almost totally through the use of language and other forms of representation. A child who is unable to effectively use or understand language is crippled throughout his period of formal education. Dr. Irving Sigel has conducted research which provides important insights into the backgrounds and learning difficulties of children who are unable to use representations of reality such as pictures or words to perform learning tasks. His findings and their implications are presented as the "Theory of Representational Competence". (Sigel and Cocking, 1977, p. 166).

Representational Competence is the ability to use representations of reality to perform logical operations. The representations may be either external, such as models, photographs, drawings, and so on, or they may be internal representations, such as mental images of past or future events, of things, and of relationships (Sigel and Cocking, 1977).

Sigel's theory is based upon the work of Piaget, who has examined the development of symbolic thought in the child. While Piaget has acknowledged the importance of social transmission as an effective factor in the mental development of the child, he has not clearly described the types of social interactions that are necessary. Sigel has extended Piaget's concepts through research to determine the particular kinds of social transmissions which lead to the development of representational competence (Sigel and Cocking, 1977). He refers to his findings as "The Distancing Hypothesis" (Sigel and Cocking, 1977, p. 166).

Sigel states:

> ...the development of representational thinking is fostered by those life experiences which create temporal, spacial, and psychological distance between the self and the object. Distancing is proposed as the construct defining those classes of behaviors or events which function to seaparate the individual from the immediate behavioral environment. For example, asking a child to reconstruct a previous experience poses a challenge to the child to bring an awareness of previous experiences. Thus the

child separates or distances himself at that moment from the present in order to reconstruct the past (Sigel and Cocking, 1977, p. 166).

Through testing, Sigel found that different children are capable of using representations of objects or experiences in performing mental tasks to varying degrees. When he observed the kinds of social interactions in the homes of those children having difficulty in using representations, he found that distancing behaviors were not used with the children. In the homes where distancing behaviors were commonly used, the children possessed a higher level of representational competence (Sigel and Cocking, 1977).

Because so much of the work that is typically expected of children from the beginnings of their formal schooling makes use of representations such as pictures and symbols, it would seem that a certain level of representational competence would be required if the child is to benefit from participation in the learning tasks.

Description of the Study

The present study was designed to investigate the question: Do activities typical of the first grade curriculum of a South Carolina School district demand a higher level of representational competence than that possesed by substantial numbers of students within that district?

A stratified random sample of sixty first grade students were selected which were representative of the district population in terms of race and socioeconomic status. Nine learning tasks requiring pictorial comprehension were selected from the readiness materials used within the district in first grade classrooms. These tasks dealt with sequencing events, interpreting a picture (as introduction to a story), determining cause and effect, determining items belonging to a given category, determining items not belonging to a given category, relating sentences to pictures, relating pictures to sentences, predicting events, and classifying objects into categories. Teachers within the district verified by questionnaire that the tasks were representative of those required of first graders in the district during the opening weeks of school.

Each child was tested individually during the first two weeks of the 1980-81 school year. The children were asked to perform the learning tasks in random order, half at one testing session, and the others at a second session one week later. They were given Sigel's Object and Picture

Categorization Test to determine their level of representational competence. By random selection, half of the children were given the Object Categorization Test during their first testing session, and the others were given the Picture Categorization Test first. The child's level of representational competence was designated as the difference in the number of appropriate grouping responses given by the child on the Object Categorization Test and the number of appropriate grouping responses given on the Picture Categorization Test. A dominant or preferred style of grouping was also determined for each child.

Findings of the Study

Analyses of the data were made by the Computer Services Center at the University of South Carolina. The Statistical Analysis System (SAS 76) was used to calculate the correlation coefficients. For the purposes of this study, a .05 level of significance was chosen as the level of significance.

Using point biserial correlation, analyses of the data revealed the following results:

1. There was not a statistically significant relationship between the child's level of representational competence and success or failure on any one of the nine learning tasks.
2. There was not a statistically significant relationship between the child's level of representational competence and the overall success rating.
3. There was not a statistically significant relationship between the child's preferred style of grouping and success or failure on eight of the nine learning tasks.
4. There was a low but statistically significant relationship between the child's preferred style of grouping and success or failure on learning task 5 (selecting the item which does not belong in a given category).
5. The child's preferred style of grouping did not correlate significantly with performance on eight of the nine first grade learning tasks used in the present study.

Certain factors were noted by the examiner which possibly affected the results obtained. First, some children became bored with the repetitiveness

of the task required on the Object and Picture Categorization Test. This caused these children to give fewer appropriate grouping responses on the second half of the test, thus affecting their scores used to define their level of representational competence. Also, some children were able to give responses on the second half of the test simply by remembering the groupings presented by the examiner during the passive sorting portion of the first half of the test. Thus, their scores were inflated on the second part of testing for levels of representational competence, whether objects or pictures were being grouped.

The lack of strong and significant relationships indicated that further analysis of the data to establish cutoff scores representing the minimum level of representational competence required for probable success on each task was not warranted. Because cutoff scores were not established, the contrasted group procedure used to determine the proportions of students having or not having the necessary level of representational competence for probable success on the various tasks was also not computed.

Conclusions

The results of this investigation indicate that:

1. Many first grade children experienced difficulty in succeeding on learning tasks that form a part of the readiness level of the first grade curriculum of their school district.
2. There was wide variation in the proportions of students having difficulty in succeeding on different tasks, indicating a stronger degree of difficulty for some tasks than for others.
3. Though most children performed better when classifying objects, some excelled when classifying pictures. The group mean was higher on the Object Categorization Test than on the Picture Categorization Test.
4. The child's level of representational competence as measured by Sigel's Object and Picture Categorization Test did not correlate significantly with performance on the first grade learning tasks used in the present study.
5. The child's preferred style of grouping did not correlate significantly with performance on eight of the nine first

grade learning tasks used in the present study.

Recommendations

As a result of this investigation, the following are suggested as recommendations for additional research:

1. A related study should be designed to focus on the reasons for the children's difficulty with the learning tasks, to investigate the question: Is the problem for the children one of task recognition and response or one of difficulty in comprehending pictorial information?
2. An alternate test of representational competence should be designed which would make use of a variety of cognitive skills (rather than just categorization) at various levels of representation. Such a test should be designed to avoid order effects and problems caused by repetition of task demands, and should be designed, if possible, for group administration.
3. A comparative investigation of child-rearing practices in the homes of lower class Black families should be designed to determine whether there is a difference in various geographical areas in the adult behaviors which are related to the development of representational competence in children.
4. Replication of the present study should be conducted with the following variations:
   a. Changes in the sample, to focus on a particular subgroup of the population, such as certain racial or socioeconomic groups.
   b. Changes in the sample to focus on the relationship of representational competence and the ability to succeed on learning tasks for children of different ages and grade levels.
   c. Changes in the learning tasks used in the study involving others at the pictorial level of representation or at the symbolic level of representation.
   d. Correlations of the results of the present study with

other individual indications of ability or experience, such as amount or kinds of preschool experience, readiness test scores, and early measures of achievements including both test scores and teachers' evaluations.

Though the present study did not indicate a strong relationship between representational competence and success on first grade learning tasks requiring pictorial comprehension, the large numbers of students experiencing difficulty with the tasks indicate the need for further research in the area.

References

Sigel, I. E., and Cocking, R. R. Cognitive development from childhood to adolescence: a constructivist perspective. New York: Holt, Rinehart, and Winston, 1977.